INFORMATICS IN PRIMARY CARE

Short report

Google searches help with diagnosis in dermatology

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ABSTRACT

Background Several previous studies have tried to assess the usefulness of Google search as a diagnostic aid. The results were discordant and have led to controversies.

Objectives To investigate how often Google search is helpful to reach correct diagnoses in dermatology.

Methods Two fifth-year students (A and B) and one demonstrator (C) have participated as investigators in this paper. Twenty-five diagnostic dermatological cases were selected from all the clinical cases published in the Web only images in clinical medicine from March 2005 to November 2009. The main outcome measure of our paper was to compare the number of correct diagnoses provided by the investigators without, and with Google search.

Results Investigator A gave correct diagnoses in 9/25 (36%) cases without Google search, his diagnostic success after Google search was 18/25 (72%). Investigator B results were 11/25 (44%) correct diagnoses without Google search, and 19/25 (76%) after this search. For investigator C, the results were 12/25 (48%) without Google search, and 18/25 (72%) after the use of this tool. Thus, the total correct diagnoses provided by the three investigators were 32 (42.6%) without Google search, and 55 (73.3%) when using this facility. The difference was statistically significant between the total number of correct diagnoses given by the three investigators without, and with Google search ($p = 0.0002$).

Conclusion In the light of our paper, Google search appears to be an interesting diagnostic aid in dermatology. However, we emphasize that diagnosis is primarily an art based on clinical skills and experience.

Keywords: diagnosis, dermatology, Google search

INTRODUCTION

Previous studies were conducted to evaluate the use of Google search as diagnostic aid.[1,2] Results were discordant and have led to major controversies. Our aim was to investigate how often Google search may help medical students and young doctors to reach diagnosis in dermatology.

METHODS

Two fifth-year medical students (A and B) and one demonstrator (C) participated independently in this paper (each investigator was supervised by one faculty member in a separate room). Twenty-five dermatological diagnostic cases were selected from all the cases published in the Web only images in clinical medicine, available in the New England Journal of Medicine Website (nejm.org), from March 2005 to November 2009. Copies of these cases without the differential diagnosis and conclusion sections were given to the investigators. The investigators read the 25 cases and selected the key words each considered the most accurate for each case. The study included two stages. In the first stage, the investigators were asked to study the cases for 20 mn and suggest up to three potential diagnoses for each, without use of any facilities. In the second stage, the investigators were asked to start a Google search using their key words, spending 20 mn, and list up to three potential diagnoses for each case. During this search, the investigators were not allowed to access Websites derived from those of the New England Journal of Medicine.

The results of each investigator were compared with the correct diagnoses as published in the case records. If one of the three suggestions given by the investigator was correct, the diagnosis was considered as true. The main outcome measure of our paper was to compare the number of the correct diagnoses achieved by each investigator without, and with the use of Google search. To reach this objective, Fisher's test was employed; $p < 0.05$ was accepted as significant.

RESULTS

The list of correct diagnoses as published in the case records, the answers given by each investigator without and with Google search are summarized in Table 1. The difference was statistically significant for the total number of correct diagnoses given by the three investigators without, and with

Table 1 Diagnoses achieved by each investigator without and with Google search

	Published diagnosis	Investigator A without Google search	Investigator A with Google search	Investigator B without Google search	Investigator B with Google search	Investigator C without Google search	Investigator C with Google search
1	Pubic louse	No	Yes	Yes	Yes	Yes	Yes
2	Geographic tongue	No	Yes	No	Yes	No	No
3	Scabies/pachyderma	Yes	Yes	Yes	Yes	Yes	Yes
4	Giant melanocytic nevus	Yes	Yes	No	Yes	No	Yes
5	Leishmaniasis (lupoid)	No	Yes	Yes	Yes	Yes	Yes
6	Squamous cell carcinoma	No	No	No	No	Yes	Yes
7	Vitiligo	Yes	Yes	Yes	Yes	Yes	Yes
8	Actinic keratosis	No	Yes	Yes	Yes	No	Yes
9	Nevus Sebaceous	No	Yes	No	Yes	No	Yes
10	Cold urticaria	Yes	Yes	Yes	Yes	Yes	Yes
11	Retiform Purpura	Yes	Yes	No	No	No	No
12	Peripheral vascular disease	No	Yes	No	Yes	Yes	Yes
13	Herpetic glossitis	No	No	No	Yes	No	Yes
14	Ehlers–Danlos syndrome	No	Yes	No	Yes	Yes	Yes
15	Acanthosis Nigricans	No	No	Yes	No	No	No
16	Peutz–Jeghar's syndrome	No	No	No	Yes	No	Yes
17	Phytophotodermatitis	Yes	Yes	Yes	Yes	Yes	Yes
18	Erythema –Ab-Igne	No	Yes	No	No	No	No
19	Minocycline induced pigmentation	No	No	Yes	Yes	Yes	Yes
20	Necrobiosis Lipoidica	No	No	No	Yes	Yes	Yes
21	Acquired Leukonychia Totalis	No	Yes	No	Yes	No	No
22	Acneiform eruption	Yes	Yes	Yes	Yes	Yes	Yes
23	Paget's disease	Yes	Yes	Yes	Yes	No	No
24	Chromoblastomycosis	No	Yes	No	No	No	Yes
25	Marjolin's ulcer	Yes	No	No	No	No	No
	Total correct diagnoses	9	18	11	19	12	18

Yes = Correct diagnosis; No = False diagnosis.

Google search (p = 0.0002). Similarly, we found a statistically significant difference for investigators A and B (p = 0.0222 and p = 0.0421, respectively). While, for investigator C, the difference was not statistically significant (p = 0.1482).

DISCUSSION

In the light of our paper, Google search seems increasing significantly the rate of reaching prompt dermatology diagnoses by students and young doctors. Thereby, it may be used with other information and communication technologies as complementary teaching modalities of dermatology.

Our significant results may be explained by the particularities of dermatology. Indeed, skin disorders are usually classified according to the nature of basic lesions (papulosquamous diseases, blistering diseases, pigmentary disorders, and so on). Thus, once the key word used for Google search includes the proper basic lesion, this search has a great chance to reach the correct diagnosis.

We emphasize that Google search can in no way replace the doctor. The art of diagnosis reasoning is difficult, and doctors become competent at it only after years of training and seeing patients.[3] Google search may act only as a diagnostic reminder or diagnostic aid.

The main limitation of our pilot survey is the shortage of the studied sample, this leads us to call for subsequent surveys including a largest population and using more relevant methods, such as in case controlled randomized studies.

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